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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,251	12/19/2005	Koji Fujimoto	36856.1396	6071

54066 7590 12/08/2009  
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EXAMINER
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EOM, ROBERT J

ART UNIT	PAPER NUMBER
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1797

NOTIFICATION DATE	DELIVERY MODE
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12/08/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JKEATING@KBIPLAW.COM  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/561,251	<b>Applicant(s)</b> FUJIMOTO ET AL.	
	<b>Examiner</b> ROBERT EOM	<b>Art Unit</b> 1797	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 10-18 have been considered but are moot in view of the new ground(s) of rejection.

The applicant has amended independent claim 10 to add the structure of reflectors to the surface acoustic wave sensor, not previously presented for consideration upon merits for patentability.

2. Applicant's arguments filed 09/22/2009 have been fully considered but they are not persuasive.

The applicants assert that Kadota fails to disclose the specific values for the Euler angles of the LiTaO<sub>3</sub> substrate and the normalized thickness of the electrodes can be used in a SAW filter that utilizes a wave other than an SH wave, and that the reference is not combinable with Lipskier, as Lipskier discloses utilizing a Love wave. However, as a Love wave is a horizontally polarized SH wave, one of ordinary skill in the art would have recognized that the benefits of the LiTaO<sub>3</sub> substrate and electrode dimensions of Kadota have on SAW devices that utilize SH waves would also be applicable to Love wave based SAW devices.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 10-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipskier (USP 5,910,286), in view of Kadota (USP 6,366,002 B1) and Springer et al. (Wireless identification and sensing using surface acoustic wave devices).

Regarding claims 10, 11, and 15-17, Lipskier teaches a chemical sensor (Fig. 4A) comprising a surface acoustic wave transducer with a piezoelectric substrate, on which are two interlocking series of electrodes (SE1 and SE2), and a sensitive layer (L) deposited on top of and covering the electrodes

Lipskier does not explicitly disclose the surface acoustic wave transducer being a rotated Y-cut  $\text{LiTaO}_3$  substrate having Euler angles of  $(0^\circ, 120^\circ \text{ to } 140^\circ, 0^\circ \pm 5^\circ)$ ; the electrodes being made of gold and having a normalized thickness of about 3.0% to about 5.0%, the normalized thickness being determined by normalizing the thickness of the electrodes by the wavelength of the surface acoustic wave; and the electrodes including reflectors arranged on both sides of the interdigital transducer in a direction of propagation of a surface acoustic wave.

Kadota teaches a surface acoustic wave device comprising: a rotated Y-cut  $\text{LiTaO}_3$  substrate having Euler angles of  $(0^\circ, 120^\circ \text{ to } 140^\circ, 0^\circ \pm 5^\circ)$  (C4/L40-42, see: piezoelectric substrate); electrodes, principally containing Au, and arranged on the  $\text{LiTaO}_3$  substrate to excite a surface acoustic wave (C4/L45); wherein the electrodes have a normalized thickness of about 3.0% to about 5.0%, the normalized thickness being determined by normalizing the thickness of the electrodes by the wavelength of the surface acoustic wave (C4/L50, see: 5% or less). It would have been obvious to one having ordinary skill in the art at the time of the invention to substitute a  $\text{LiTaO}_3$  surface acoustic wave device with gold electrodes in the chemical sensor of Lipskier, as taught by Kadota, since doing so causes the propagation loss to become substantially zeros even where the film thickness is extremely small, thereby making the conditioning range of the frequency trimming much wider than conventional surface acoustic wave devices (Kadota: C3/L30-37).

Springer teaches a SAW device comprising a plurality of interdigital transducers with reflector grating arranged on both sides of the transducers (Fig. 1). It would have

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been obvious to one having ordinary skill in the art to incorporate reflector gratings into the SAW device of modified Lipskier, as taught by Springer, since doing so would direct acoustic wave energy through the piezoelectric material to compensate for the instability effects produced by the preferential direction of transmission exhibited by the piezoelectric material.

Regarding claims 12-14, modified Lipskier discloses all of the claim limitations as set forth above. Lipskier further discloses a bonding layer, placed between the reaction membrane and the electrodes, and arranged to improve the bond between the reaction membrane and the electrodes (C6/L56-C7/L19); a protective layer, placed between the bonding layer and the electrodes, lying over the electrodes and regions outside the electrodes (Fig. 4A, see: intermediate material L1; C5/L22-33).

Regarding claim 18, modified Lipskier discloses all of the claim limitations as set forth above. Lipskier further discloses the reaction membrane includes a substance bound to a biological substance that is a target substance and the mass applied to a surface of the substrate of the surface acoustic wave sensor is varied due to the bind of the biological substance to the reaction (C6/L17-21).

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT EOM whose telephone number is (571)270-7075. The examiner can normally be reached on Mon.-Thur., 9:00am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/  
Primary Examiner, Art Unit 1797

/R. E./  
Examiner, Art Unit 1797